

THE TREATMENT OF CICATRICIAL STRICTURE
OF THE OESOPHAGUS BY RETROGRADE
DILATATION.¹

By GEORGE WOOLSEY, M.D.,

OF NEW YORK,

SURGEON TO BELLEVUE HOSPITAL; PROFESSOR OF ANATOMY AND CLINICAL
SURGERY IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY
OF THE CITY OF NEW YORK.

RETROGRADE dilatation for cicatricial stenosis of the oesophagus was first performed, so far as I am able to discover, by Von Bergmann early in 1883, and at about the same time by Schattauer. Dr. Abbe has credited Albert with the first operation of this kind, but I have been unable to find any report of the case. The suggestion is ascribed by Newman² to Schede, though Schede's suggestion seems to have related to pyloric and not to oesophageal strictures. Trendelenburg³ in reporting the first successful case of gastrostomy in Germany, which was operated on by him for cicatricial stenosis, remarked that an attempt was made to enlarge the stricture from the stomach by a sound, but did not succeed. This is the earliest instance that I know of where not only the idea was suggested by an attempt made to apply it in practice. Loreta, to whom Franks⁴ wrongly ascribes the idea, as well as the first performance of the operation, may be considered as its step-father, for in the same year with Von Bergmann's and Schattauer's operations he operated twice, and shortly afterwards twice again.

The cases previously reported of retrograde dilatation for

¹ Read before the New York Surgical Society, December 12, 1894.

² London Lancet, February 13, 1892, p. 359.

³ Langenbeck's Archiv für klinische Chirurgie, 1877, Bd. xii.

⁴ ANNALS OF SURGERY, xix, 1894, pp. 355-378.

cicatricial or simple stricture, which I have been able to find, number 27, making 28 with the case now reported for the first time.

Hagenbach,¹ in 1889, collected six cases, including Socin's, which he reported, and not including Loreta's, to whom he referred as having operated without knowing the number of his cases. Two years later Gissler² reported eight cases, without, however, including Loreta's, and two years later still H. Krüger³ recorded nine cases, omitting also the Italian ones. During the present year Kendall Franks⁴ collected twenty-one cases, but two of these form but a single case reported by Gissler, but operated by Kraske.

To those twenty cases I am able to add eight more, including my own.

CASE No. 21.—Schattauer's case, the second case operated upon, referred to,⁵ and included in the lists of Krüger and Gissler. The case was one of double stricture of the oesophagus, due to swallowing sulphuric acid. Attempts to dilate from above or below after a gastrostomy in two sittings were unsuccessful, until a small bougie was introduced up to the stricture from below by a straight oesophageal forceps, the blades of which were then opened, allowing the bougie to be pushed up through. Then larger and larger bougies were used until the patient could take nourishment by the mouth, and was cured.

CASE No. 22.—Abbe's second case.⁶ Here what seems to me to be the ideal method was used. The entire procedure was completed in a single operation. The stricture was dilated as much as possible by bougies pulled up from below by a silk thread, and then the string-saw method was used to further dilate, or rather divide up to the limit. The wounds were closed, and after a few days bougies were passed from above.

CASE No. 23.—Edmund Andrews reports⁷ the case of a child of

¹ Correspondenzblatt für Sch. Aerzte, March, 1889.

² Beiträge zur klinische Chirurgie, Bd. VIII.

³ Münchener medicinische Wochenschrift, 1893, pp. 226-229.

⁴ Loc. cit.

⁵ Centralblatt für Chirurgie, 1884, p. 95.

⁶ ANNALS OF SURGERY, January, 1894, p. 88.

⁷ Chicago Clinical Review, Vol. III, February, 1894, p. 292.

three years, whose œsophageal stricture, due to the swallowing of lye, gradually became impermeable in spite of the passage of bougies. Here, too, the operation was done in one sitting, including suture of the wounds. The œsophageal opening could not be felt by the finger introduced into the stomach, but was entered by a small bent uterine sound, then a larger one was passed up, which was replaced by dilating forceps, allowing the final passage of a large Britannia metal sound with considerable force.

CASE No. 24.—W. J. Mayo¹ reports the case of a child of three years, who had swallowed lye one year before. For six months there had been difficulty in swallowing liquids, more than one-half of the food being regurgitated. The œsophagus above the stricture held over four ounces. Repeated attempts to pass bougies, with and without anæsthesia, failed. Gastrostomy after Fenger's method. The lower surface of the stricture was searched several times for the opening, twice with the aid of the finger through the small fistula, but without success. Five weeks after the first operation external œsophagotomy, through which bougies were pressed down from above, and by the help of a finger in the stomach, a long probe was finally passed through carrying two strands of braided silk. Abbe's string-saw method was then used, modified by using knots in the second thread to dilate the stricture, instead of a bougie. For one month this process was repeated every four days. Bougies were then inserted from the neck, and later through the mouth, and the threads were removed after five weeks. In two months the patient was discharged able to take milk, chopped meat and bread quite readily. The œsophageal fistula had closed, and the gastric fistula nearly so, after being touched with the Paquelin.

CASE No. 25.—The case operated upon by Dr. Murray, according to Abbe's method, and reported and shown to this society at the meeting held October 10, 1894, and published,² has been so recently before the society as to need no further description.

The same may be said of

CASE No. 26, which was reported at the same by Dr. Kammerer as having been operated upon by Dr. Gerster.

CASE No. 27.—Another case, also operated by Dr. Gerster and reported by him in his book,³ may be classed among these cases, for,

¹ New York Medical Journal, 1894, Vol. LIX, p. 433.

² ANNALS OF SURGERY, Vol. XX, December, 1894, p. 733.

³ Aseptic and Antiseptic Surgery, 3d ed., p. 154.

though the retrograde dilatation was not apparently continued after it had been once successful, it apparently paved the way for dilatation from above. The stricture, twelve inches from the incisor teeth, was due to swallowing carbolic acid. Gastrostomy in two sittings. Daily attempts were made for twenty-three days to pass the stricture with a sound from below before it was successful. Finally, an elastic catheter with a stylet was passed, and the next day the passage of a small-sized sound from above was possible.

CASE No. 28.—The case I have to report is as follows: Mrs. M. J., aged thirty-two, was admitted to Bellevue Hospital February 7, 1894. In November, 1893, she swallowed some potash lye by mistake. After the acute symptoms passed off she found that she could not swallow solids. She had therefore fed on milk, the swallowing of which became more and more difficult, and sometimes impossible. Solid food soon after being swallowed was regularly regurgitated, and at times, especially in the morning, milk was also largely regurgitated. The patient was emaciated, though not yet extremely so. Repeated and unsuccessful attempts to pass bougies of all kinds and sizes were made by Dr. J. Wohlfurth, of this city, by whom the patient was referred to me. I repeated the attempts at the hospital without success. A No. 9 (Eng.) œsophageal bougie passed ten or ten and a half inches from the incisor teeth, but no further. This would locate the upper end of the stricture four or four and a half inches below the upper end of the œsophagus, which would bring it near the level of the bifurcation of the trachea. After swallowing considerable fluid the lower part of the neck anteriorly seems distended and enlarged. Gastrotomy with retrograde dilatation of the stricture, with or without the use of Abbe's string-saw method, was determined upon, Dr. Abbe having kindly lent me several instruments for the purpose.

February 12, 1894. Under ether the attempt was again made to pass bougies from above, but without success. Accordingly a gastrotomy was performed after Fenger's method with a four-inch incision. The stomach was easily found, sutured into the abdominal wound, and opened by a free incision about two inches long. The stomach was then washed out and the finger introduced. Even through this large opening, and with considerable pressure, it was found very difficult to explore the cardiac orifice of the stomach, and it was only after some time that it was found. A No. 9 (Eng.) bougie was then guided into the œsophagus by the finger. This was resisted at the stricture, but after a little steady pressure it passed through.

Two stout silk strands were then threaded through the end of the bougie and brought out through the mouth. By one of these conical capped bougies were drawn up through the stricture, the size increasing up to No. 15 (Eng.). When firm resistance was met, the second string was used as a saw, according to Abbe's method. Owing to the length of the stricture, exact measurement of which could not unfortunately be taken, bougies not capped and pulled through could not be passed even after active use of the string-saw. Consequently, a large perineal drainage-tube was pulled up through the stricture and left with the lower end passing out through the abdominal opening, where the mucous membrane had been sutured to the skin. Owing to the large size of the opening and the difficulty of retaining the stomach contents rectal feeding had to be resorted to almost exclusively until the second operation, one week later. At that time the drainage-tube came away easily, having acted as a dilator. Capped bougies No. 17 and 19 (Eng.) were drawn up through the stricture by means of silk strands passed as before. The string-saw was again used, and McKenzie's bougies of the largest size were thus passed from below without much difficulty. The stomach was then detached from the abdominal wound, and the gastric opening was sutured by a continuous Lembert suture, and an outside interrupted Halsted quilted suture of fine silk. The stomach was then dropped back, and the abdominal wound sutured in the ordinary way. Uneventful healing *per primam*. Food was taken by the mouth after three days, and patient found that she could swallow liquids much more easily without their being arrested or regurgitated. She was encouraged to eat soft food, which also passed, but on the first attempt to pass a bougie, about a week after the last operation, only a No. 9 (Eng.) conical bougie would pass. This was continued every other day, the size being slowly increased to No. 12 (Eng.), when she left the hospital, March 13, having gained eleven pounds. Since leaving the hospital the patient has returned twice or three times a week, and by July 1 a No. 18 (Eng.) bougie had passed, and some time previously she had been eating almost all kinds of solid food, and had gained more than twenty pounds, and looked like a different woman.

At the first operation, no bougie, unless guided by a string, would pass down the oesophagus, apparently on account of the pouching of the oesophagus about the stricture. After the second operation, however, the pouch had already contracted considerably, and the stricture was more fully dilated, so that a bougie would pass from above,

though not as easily or as certainly as from below. A mistake was made in not passing bougies sooner after the second operation, as I think ground was lost by allowing the stricture to recontract. At the present time a No. 19 (Eng.) conical bougie passes the stricture, and the patient can swallow all kinds of food. Bougies are still passed twice a week.

Among the twenty-eight cases the details of technique present considerable variety, often showing much ingenuity in overcoming difficulties.

The method of operating on the stomach varies between gastrotomy and gastrostomy. Gastrotomy, where the stomach is opened and closed in one operation, is the method employed by Loreta in his cases, which was similar to that previously employed and recommended by him in pyloric stenosis, with the exception that a long and powerful dilator took the place of the finger as the dilating instrument. This method was followed by Catani and Frattina in their cases, as also later in the cases of Spannoche and Franks, and essentially in that of Andrews.

The principal objection to Loreta's method depends upon the violence of the dilatation. This was shown in at least two of his cases, where alarming symptoms of dyspncea, high pulse, respiration, and temperature, with cough and bronchorrhcea commenced on the fourth day after the operation and lasted five days. Barring this objection, and provided the functional results and percentage of mortality are equally favorable, the method of Loreta in one sitting seems to me preferable to a gastrostomy where a fistula remains a varying length of time. This being the case, I think that Abbe's method, as employed in his second case, is the ideal method, combining the advantages and avoiding the disadvantages of Loreta's operation. Abbe's method has been briefly described in noticing his second case. In both Abbe's and Loreta's cases the functional result was a cure so far as recorded, and in all there was no death. I would lay down, then, as the first proposition,—

(1) That if it is possible to dilate the stricture sufficiently in one sitting, the wound of the stomach should be closed immediately.

This may be impracticable if the patient is so weak that feeding by the stomach at once is essential, or if, for any reason, rectal feeding is insufficient or impossible. Furthermore, the ideal procedure may be modified if, as happened in my case, it is not possible to dilate the stricture sufficiently at the first operation. In such a case after a short and varying time, during which rectal feeding may be partly or entirely depended upon if the opening into the stomach is large, a second retrograde dilatation may, and in my case did, dilate the stricture to the largest size, after which the gastric wound may be closed.

If gastrostomy instead of gastrotomy is done, as it has been in seventeen out of the twenty-eight cases, the operation may be and is done in either one or two sittings. In at least five or six of the above seventeen cases gastrostomy was done in one sitting. Formerly, to judge from a study of statistics, the operation in two sittings was preferred by most on account of the lower mortality. The above cases are too few for comparison, but I think that at the present time with proper care the one is as safe as the other. That being the case the operation in one sitting is to be preferred, for it has certain advantages. If it is found possible and practicable to dilate sufficiently at once, the stomach may be sutured and dropped back, and the abdominal wound closed after dilatation is completed, as in the ideal method.

At least two of the cases operated on in one sitting and mentioned above would probably have been completed in one operation if the dilatation had been satisfactory at the first operation. Again, if rectal feeding is not satisfactory or is contra-indicated, and the weak condition of the patient demands nourishment as soon as possible, the operation in one sitting is to be preferred.

As a second proposition, then, we can say,—

(2) That the opening of the stomach is best done in one sitting. Furthermore, the size of the opening into the stomach is another detail of importance that varies in practice. The question of the size of the opening depends partly upon how the dilatation is to be done and the after-treatment of the case. If either Loreta's or Abbe's methods are employed, the opening

should be large enough to allow the easy introduction of one or two fingers besides dilating instruments. The only objection to a large opening is the difficulty of preventing the leakage of the stomach contents, as was experienced in Von Bergmann's case. But this may occur, no matter how small the opening, unless some method, such as Witzel's, Von Hacker's, Francke's, or Hahn's is used, and it may be minimized by making the opening as high up on the anterior wall and as near the cardia as possible; a position which is also the best for dilating the oesophagus. Moreover, if the opening is large, the chances are that there will be little delay in dilating the oesophagus, after which the opening may be closed, and during this time feeding by the rectum may be satisfactorily employed as in the case I have reported. The great objection to a small opening lies in the difficulty of reaching and finding the cardiac opening of the oesophagus. It is not always easy in any case, as I have found myself, and in the report of Loreta's cases by T. Holmes, the statement is made that finding the orifice of the oesophagus "involved considerable difficulty." Much greater is the difficulty when the opening is small, as many of the histories of these cases indicate. In most of the cases operated on, in two sittings the opening was intentionally made small to avoid, as far as possible, the difficulty of leakage through the fistula. But in Caponotto's case, as well as in Von Bergmann's, operation in "one sitting," a large opening was made to give better access to the lower end of the oesophagus, and, to quote Gissler,¹ it is doubtful if the dilatation of the stricture would have otherwise succeeded in Von Bergmann's case unless he had been able to examine the cardia with the finger. Nor is this a solitary instance, for the same may be said of Caponotto's case and several others.

When the opening is small, the finger can only be introduced through it with difficulty, if at all. With the finger so introduced it would be difficult to find the oesophagus, or, if found, to do anything with the finger in guiding bougies or instruments, unless the stricture were just at the cardiac orifice of the stomach. As Gissler² says, the introduction of sound or

¹ Beiträge zur klinischen Chirurgie, Vol. VIII, p. 409.

² Loc. cit.

catheter-like instruments into the oesophagus from the fistula is a matter of chance, no rules can be laid down for it. This is illustrated by Kraske's case, reported by Gissler, in which repeated attempts were made for a long time (two months), even with artificial illumination of the stomach, and yet without success. A third proposition follows from this,—namely,—

(3) The opening into the stomach should be of sufficient size to allow of the use of the finger in examination and in guiding instruments to the cardiac orifice of the oesophagus.

Another question is as to the closure of the operation wound or fistula. There is no doubt in my mind that the best method is to close the opening in the same operation in which it is made, as in the methods of Abbe or Loreta. If this is not done, the opening should be closed as soon as possible, and the larger the opening the sooner should it be closed. Of course, closure of the opening is not to be done until dilatation has been fully accomplished, or, failing in this, until dilatation has been sufficient to allow of feeding by the mouth and continued dilatation of the oesophagus from above. It should be remembered, as Gissler¹ says, that an examination of the literature shows that it has not infrequently given great difficulty to close the fistula. This is a decided objection to the operation in either one or two sittings, in which a small opening is made with a view of leaving it for some time for the purpose of feeding until dilatation has eventually been accomplished. The closure of the wound is best done by freeing the stomach from the abdominal wound, closing the gastric wound, and dropping the stomach back into the abdomen. This is preferable to trying to close the fistula while leaving the stomach adherent to the anterior wall of the abdomen, as was apparently done in the case reported by Krüger² from Hoffa's clinic, in which the fistula so closed was repeatedly torn open and as often resutured.

The methods of passing the first dilator or guide for a dilator through the stricture are many and ingenious. In most of the cases reported the stricture was impassable from above.

¹ Beiträge zur klinischen Chirurgie, Vol. VIII, p. 409.

² Loc. cit.

This is easily explained by the pouching which almost always occurs above such a stricture, the opening of which may also be situated eccentrically. From below, however, we have an inverted funnel-shaped segment of the oesophagus leading directly into the lower end of the stricture. The most natural way to proceed, and the one most likely to succeed in the majority of cases, is to pass a small instrument up from below. This, we have seen, is one of the strong arguments in favor of a large opening into the stomach by means of which we can guide an instrument into the oesophagus by the finger. In two cases (Maydl's and Lange's) a bougie was passed from above by which a silk ligature was carried through the stricture. In another case (Caponotto's), under control of the finger in the stomach, the rod of a Verneuil's dilator, introduced from above, was passed into the stomach, where olive-shaped bulbs were attached and drawn up. In Von Bergmann's case the sound introduced from above could not find the opening, and under control of the finger in the stomach was forced through the thin layer of interposing tissue. Schattauer, unable to pass a fine bougie from below, introduced it into the stricture from below in an oesophageal forceps and then on opening the blades of the forceps, and thus, stretching the stricture, he was able to push the bougie through. These are all solitary examples, and most of them were expedients for an emergency. There is one expedient of passing a guiding thread from above which deserves to be mentioned, for it will probably be found to be the method best to adopt when for any reason a small opening has been made into the stomach. This was first employed in Socin's case, reported by Hagenbach, and consists of swallowing or introducing as far as possible into the stricture a thread fastened to a small shot. This works down through the stricture, falls to the lower part of the stomach, whence the thread may be hooked out through the fistula. It seems to work better than a modification of it, used in Kraske's case, where a knot replaced the shot, and when it had passed into the stomach it did not fall to the lower part but stuck in the folds of the membrane, and could not be found until it was flushed out with water. The mere use of a thread as a guide through

the stricture for use in dilatation, and without its passage by a shot, cannot properly be called Hagenbach's or Socin's method, as has been done by Franks in his list of cases, for this had been used previously by Maydl and Soldani, by both of whom it was passed by means of a fine bougie, as is done in Abbe's method.

The methods of dilating the stricture are even more numerous, varied, and ingenious than are those for passing a guide. The method most often used among the twenty-seven cases has been the rapid or immediate method of Loreta, of which there are ten or eleven cases. Sometimes a uterine, pharyngeal, or Otis's dilator has been used. Loreta used a large, long-bladed dilator. In other cases I have found no mention of the particular instrument employed. The only objection to this method is the possible occurrence of the complication noted in two of Loreta's cases and already referred to. Next in frequency of application are Abbe's method and what may be called Maydl's method, in which larger and larger conical-capped bougies are drawn up by a silk ligature attached to the cap. Abbe's method comprises the latter and supplements it by the string-saw when the size of the bougie is such that it cannot be pulled or pushed through without considerable force. The stricture is put on the stretch by means of the largest possible bougie passed into it from below, or, as in Mayo's case, by a second cord with a large knot drawn into the stricture. The string-saw only cuts the parts put upon the stretch, and is therefore safe as well as effective. The nearest approach to this method was that employed by Soldani in the early treatment of his case, when he pulled up through the stricture larger and larger knots made on a cord passing through the stricture. "Olives" on a string or staff or on a bougie have been employed in several cases, while single instances of the following methods are on record: sponge tent by Von Bergmann, electrolysis by Hjort, and internal oesophagotomy by Lange, in both the latter cases the instruments being passed from below. In Socin's case increasing sizes of violin strings were drawn up through the stricture and left in position about two hours, while their increase in size from absorption of moisture gradually dilated the stricture. In the case I have reported, the dilating force was twofold. I am

inclined to think that the most effective part was the passage of conical bougies pulled up from below by the silk ligature attached to the metal caps. This dilated it for the passage of bougies large enough to have sufficient stiffness to be pushed through from below. I could also readily feel that the use of the string-saw, according to Abbe's method, was quite effective. That it was not more so was due probably to the fact that the stricture was a long and rather tortuous one, and perhaps it was not as well applied as by its originator. My experience with it was sufficient to enable me to bear testimony to the efficacy of this ingenious method. I can heartily second Dr. Abbe's recommendation of it in case bougies of increasing size cannot be passed without undue force. It will probably be applicable in a large proportion of cicatrical strictures, and especially effective when the length of the stricture is not great. It is on the whole the most ingenious, the safest, and the surest operation, and the one most to be recommended.

The after-treatment allows of but little variation. After the stricture has been rapidly dilated, the passage of bougies from above has almost always been employed for some time with increasing intervals. This is necessary to insure the patency of the canal. In the second of Loretta's cases, however, three months after the operation no instrument had been passed by the mouth, and the patient was able to take food of all kinds and was quite well. When, however, the stricture is rapidly stretched or cut, I see no reason why recontraction should not take place as it has been found to do after internal oesophagotomy unless bougies are occasionally passed. In the case I have reported this is exactly what happened, for the passage of the first bougie was delayed too long (eight days), and whereas at the second operation the largest-sized bougie passed a week later, a No. 9 (Eng.) was passed with difficulty from above. It would be decidedly unsafe, it seems to me, to omit the passage of bougies for any length of time until the tendency to recontract is found to have disappeared, in spite of the fact that both Lange and Sands have reported a lack of tendency to recontraction after oesophagotomy. Of course, if at the operation bougies of at

least eighteen millimetres in diameter could not be passed, the process of dilatation must be continued until this point is reached, and as long after as required. The swallowing of solid food as soon as that becomes possible may also serve a useful purpose in keeping the strictured oesophagus dilated.

There can be no question, it seems to me, that the class of operations that we have been considering is far preferable to any other form of treatment of an impermeable cicatrical stricture of the oesophagus. Two substitutes for this operation may be mentioned, the first without any recommendation, though it has that of Graser,¹—namely, the performance of external oesophagotomy,—and through this dilating from above or performing internal oesophagotomy according to the method of Gussenbauer. Graser says that in cases of impermeable or very narrow strictures of the oesophagus, the stricture, even when just at the cardia, is easy to pass from the fistula in the neck, and can be quickly dilated by permanent bougies. He adds that in Erlangen this procedure is used for cicatrical as well as carcinomatous stenosis with the best result. The experience of most surgeons is at variance to this,—namely, that a stricture impermeable from the mouth is nearly equally so from the neck, and that both Graser's and Gussenbauer's methods are not successful in such cases. Abbe found this to be so in his first case, and many others have had the same experience.

Secondly, as compared with gastrostomy, we have in retrograde dilatation a radical cure or a *restoratio ad integrum*, or nearly so, instead of a fistula with various degrees of discomfort according to the difficulty of preventing leakage. As to the immediate results so far all the twenty-eight cases of retrograde dilatation reported have been successful, with no death due to the operation, a rather remarkable showing considering the weakened condition of some of the patients. Newman reported in 1892 forty-eight cases of gastrostomy for cicatrical stenosis since 1876, of which twenty-five recovered and twenty-three died within a month.

¹ Verhandlungen der deutschen Gesellschaft für Chirurgie, xix, 1, p. 136.

Furthermore, the above twenty-eight cases were successful from a functional stand-point. If gastrostomy is to be done, Witzel's method would be preferred, except for one drawback. The opening into the stomach is so small that exploration with the finger or instrumental dilatation cannot well be carried on, for it seems to be a disadvantage to make a large gastric opening in Witzel's operation and then suture it up. Again, after a Witzel operation is completed, the fistula is not straight, and retrograde dilatation would be impossible. For this reason a gastrostomy according to von Hacker would be preferable, but even here, on account of the small size of the opening, retrograde treatment would be difficult or impossible without the expedient of a shot-weighted string employed by Socin and reported by Hagenbach.

There is one question of interest in connection with simple gastrostomy performed for such cases. This may be introduced by the statement of von Hacker, who says that after gastrostomy one is, as a rule, able later on to pass a thin catgut through the stricture even when it was not possible during the operation, and on this as a guide to pass a string out through the fistula, with the aid of which one can gradually dilate the stricture by means of bougies, etc. This is the plan of operation now employed and lately reported by von Hacker.² The part of this statement which is of interest is the fact referred to that after a period of rest due to the gastrostomy the oesophagus may become permeable from above. Thus von Noorden³ reports a case operated by Mikulicz, in which a gastrostomy according to Witzel was done for an impermeable cicatricial stricture due to swallowing lye. After four weeks' rest of the oesophagus the patient was again able to swallow fluids. Dilatation was commenced from above, and in four weeks' time every kind of cooked food could be swallowed. Fifty-seven days after the operation the tube was removed from the stomach, and in sixteen days more the fistula was solidly and spontaneously healed. Also in two cases of carcinomatous stricture after operation swallowing became easier.

¹ *Archiv für klinische Chirurgie*, Band XLV, pp. 605-621.

² *Wiener klinische Wochenschrift*, 1894, Nos. 25 and 26.

³ *Berliner klinische Wochenschrift*, 1893, p. 96.

This same fact is incidentally recorded in a number of operations in which gastrostomy has been performed for simple or malignant stricture. But the objection of recommending it as a substitute for retrograde dilatation, especially of the ideal kind, is the fact that it is not constant. In some cases, especially of non-malignant stenosis, the stricture is just as impermeable as before, and the patient is then left with a gastric fistula, which must permanently remain unless further operation is submitted to. Thus in Terrillon's case, at the end of eight months the stricture was still impermeable from above, and retrograde dilatation was then successfully employed. Similar cases of the stricture remaining impermeable after the gastrostomy are recorded by Ewald,¹ Lafourcade,² Schattauer (Case No. 21, above), and by others. On account of the uncertainty of the result, therefore, it cannot be considered an operation of choice or one to replace retrograde dilatation by the method used by Abbe in his second case. If for any reason the latter should be contraindicated or refused, and I cannot imagine that it would often happen, the best alternative would seem to me to be the performance of a gastrostomy according to von Hacker, and the passage of a shot-weighted thread through the stricture. By means of this string dilatation in either direction, preferably retrograde, could be undertaken. As a second but more uncertain alternative I would suggest gastrostomy according to Witzel, complete rest of the oesophagus for three or four weeks, and then attempts to dilate from above, which may or may not succeed. If successful, the fistula may close spontaneously.

¹ *Zeitschrift für klinische Medicin*, xx, pp. 534-560.

² *Gaz. hebdom. de Méd. et de Chir.*, par. 91, 2 S. XXVIII, 549-552.